

REMARKS

The above amendments to claims 1, 28 and 69 address the rejections under 35 U.S.C. §112, second paragraph. The amendments to claims 1 and 28 clarify that the “covering” of the core includes a grafting agent. These amendments do not change the scope of the claims.

Applicant’s Attorneys could not identify any pending claims which used the language “type of,” so no amendments were made in response to this rejection.

The amendment to claim 69 clarifies that the alkyl methacrylate, statistical copolymer of alkyl methacrylate or styrene-acrylonitrile copolymer defined in subparagraph (b) is part of the shell and not the core. This clarification does not reduce the scope of the claims.

Rejection Under 35 U.S.C. §102(b)

It is stated in the office action that the reference Aoyama et al. does not disclose a core/shell impact additive with a core covering comprising a grafting agent as recited in part 2 of claim 28. This grafting agent is required by claim 28 and therefore, this claim is not anticipated by Aoyama et al.

Rejection Under 35 U.S.C. §103(a)

Claims 1-34 and 36-70 have been rejected under 35 U.S.C. §103(a) in view of Brown et al. (USP 4,788,251), Wu et al. (USP 5,346,954), Dunkle (USP 4,659,767) and optionally in view of Aoyama et al (USP 5,360,865). The newly cited references, either alone or in combination with Aoyama et al., do not show or suggest all of the features of the core/shell impact additives of the compositions claimed herein.

These newly cited references are not shown to disclose or suggest the use of a core/shell impact additive with a core comprising a nucleus and covering as defined in claims 1 and 28. Therefore, claims 1-34 and 36-48 are unobvious in view of these references.

Claims 49-68 define thermoplastic polymer compositions having a core/shell impact additive with a three component core. The three component core comprises

- (1) a copolymer of an N-alkyl acrylate (the alkyl group having a carbon number ranging

from 5 to 12;

(2) a polyfunctional crosslinking agent possessing unsaturated groups (at least one of which is a vinyl group) and

(3) a diallyl maleate as a grafting agent.

None of the cited references show or suggest this specific combination of components for a core. Similarly, claims 69 and 70 are unobvious in that they define a composition with a core/shell impact additive having a three component core comprising:

(1) a diallyl maleate grafting agent,

(2) a polyfunctional crosslinking agent possessing unsaturated groups (at least one of which is a vinyl group) and

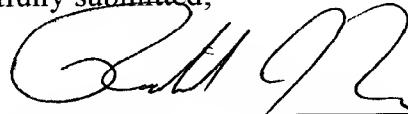
(3) either

a) a polyorganosiloxane or

b) a copolymer of an N-alkyl acrylate (the N-alkyl group having 5 to 12 carbon atoms).

In that none of the cited references, either alone or in combination, have been found to show or suggest a combination of core components for a core/shell impact additive as required in claims 49-70 and none of the cited references, either alone or in combination, have been found to show or suggest a core comprising a nucleus and covering as required in claims 1-34 and 35-48, Applicants submit the rejection under 35 U.S.C. §103 should be withdrawn and that all pending claims are in condition for allowance.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Thrice Amended) A polyvinyl chloride composition containing a core/shell impact additive said impact additive comprising:

a) 70 % to 90 % by weight of a crosslinked elastomeric core composed:

1) of 20 % to less than 100 % by weight of a nucleus composed of a copolymer (I) of an n-alkyl acrylate, the alkyl group having a carbon number ranging from 5 to 12, of a polyfunctional crosslinking agent possessing unsaturated groups in its molecule, at least one of which is a vinyl group and optionally of a polyfunctional grafting agent possessing unsaturated groups in its molecule, at least one of which is an allyl group,

2) of not more than 80 % by weight, of a covering composed of a copolymer (II) of n-alkyl acrylate, the alkyl group of which has a carbon number ranging from 4 to 12, ~~or of and~~ a grafting agent possessing allyl groups, the said covering containing a molar amount of grafting agent ranging from 0.05 % to 2.5 %, said grafting agent having only allyl functional groups, all having the same reactivity and,

b) 30 % to 10 % by weight of a shell grafted onto the said core composed of a polymer of an alkyl methacrylate, the alkyl group of which has a carbon number ranging from 1 to 4, or alternatively of a statistical copolymer of an alkyl methacrylate, the alkyl group of which has a carbon number ranging from 1 to 4, and of an alkyl acrylate, the alkyl group of which has a carbon number ranging from 1 to 8, containing a molar amount of alkyl acrylate ranging from 5 % to 40 %, or alternatively composed of a styrene-acrylonitrile copolymer.

28. (Thrice Amended) A thermoplastic polymer composition containing a core/shell impact additive said impact additive comprising:

a) 70 % to 90 % by weight of a crosslinked elastomeric core which is composed;

1) of 20 % to less than 100 % by weight of a nucleus composed of a copolymer (I) of an n-alkyl acrylate, the alkyl group of which has a carbon number ranging from 5 to 12, of a polyfunctional crosslinking agent possessing unsaturated groups in its molecule, at least one of which is of a vinyl group, and optionally of a polyfunctional grafting agent possessing

unsaturated groups in its molecule, at least one of which is an allyl group,

2) of an amount above 0%, but not more than 80 % by weight, of a covering composed of a copolymer (II) of n-alkyl acrylate, the alkyl group of which has a carbon number ranging from 4 to 12, or of and a grafting agent possessing allyl groups, the said covering containing a molar amount of grafting agent ranging from 0.05 % to 2.5 %, said grafting agent having only allyl functional groups, all having the same reactivity,

b) 30 % to 10 % by weight of a shell grafted onto the said core composed of a polymer of an alkyl methacrylate, the alkyl group of which has a carbon number ranging from 1 to 4, or alternatively of a statistical copolymer of an alkyl methacrylate, the alkyl group of which has a carbon number ranging from 1 to 4, and of an alkyl acrylate, the alkyl group of which has a carbon number ranging from 1 to 8, containing a molar amount of alkyl acrylate ranging from 5 % to 40 %, or alternatively composed of a styrene-acrylonitrile copolymer.

69. (Amended) A thermoplastic polymer composition containing a core-shell impact additive, such impact additive comprising:

(a) 70% to 90% by weight of a crosslinked elastomeric core composed of either a polyorganosiloxane or a copolymer of an n-alkyl acrylate, the n-alkyl group having from 5 to 12 carbon atoms, said elastomeric core further comprising:

a polyfunctional crosslinking agent possessing unsaturated groups in its molecules, at least one of which is a vinyl group, and

diallyl maleate as a grafting agent, and

(b) 30 % to 10 % by weight of a shell grafted onto the said core wherein said shell is composed of a polymer of an alkyl methacrylate, the alkyl group of which has a carbon number ranging from 1 to 4, or alternatively of a statistical copolymer of an alkyl methacrylate, the alkyl group of which has a carbon number ranging from 1 to 4, and of an alkyl acrylate, the alkyl group of which has a carbon number ranging from 1 to 8, containing a molar amount of alkyl acrylate ranging from 5 % to 40 %, or alternatively composed of a styrene-acrylonitrile copolymer.